

REMARKS

This paper is responsive to the final office action dated January 9, 2006. In the final office action, the examiner has set forth new grounds of rejection. Specifically, claims 17-20 have been objected to as depending from withdrawn claim 16, and claims 1-5, 21, 22, and 27 have been rejected under 35 U.S.C. § 102(b) as anticipated by Hosick et al., U.S. Patent No. 6,032,904. In addition, claim 17 has been rejected under 35 U.S.C. § 103(a) as obvious over Hosick et al. in view of the Boeing '702 satellite. Claims 23 and 24 have been rejected as obvious over Hosick et al. in view of Baghdasarian, U.S. Patent No. 6,010,096. In addition, the examiner has indicated that the most recent amendment (filed on October 11, 2005) had improper identifiers for the claims, in that it did not identify claims 6-15 and 18-20 as "withdrawn."

Reconsideration and allowance of the claims is respectfully requested in view of the following remarks.

Independent claim 1, and claims 2-15 and 17-24 depending therefrom, are directed to an attitude determination and control system for a spacecraft. The attitude determination and control system includes a attitude sensor set that is adapted for use during both transfer orbit operation and on-station operation of the spacecraft, and a processor capable of determining and controlling attitude of the spacecraft during those operations using sensor inputs solely from the attitude sensor set.

Independent claim 27 is directed to an attitude determination and control system for a spacecraft that includes a plurality of star trackers adapted for use during both transfer orbit operation and on-station operation of the spacecraft, and a processor capable of determining and controlling attitude of the spacecraft during those operations using inputs from the star trackers as the sole source of attitude sensor data.

Claim Objections

Claims 17-20 have been objected to because they depended from canceled claim 16. Applicants respectfully traverse this objection, as claims 17 and 18 have been

amended to depend from claim 1. Accordingly, this objection is moot in view of the claim amendments.

Applicants appreciate the waiver of the requirement regarding improper status identifiers. The status identifiers have been corrected and are now believed to be in proper form.

35 U.S.C. § 102(b) Rejections

Claims 1-5, 21, 22, and 27 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Hosick et al., U.S. Patent No. 6,032,904. Applicants respectfully traverse these rejections. Under Section 2131, the MPEP directly states: "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." See, *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987).

Hosick et al. is directed to a thruster system that can be used for orbit raising and station keeping. However, Hosick et al. does not disclose or suggest the use of an attitude sensor set that is adapted for use during both transfer orbit operation and on-station operation of a spacecraft, as recited in claim 1, nor does Hosick et al. disclose or suggest the use of star trackers during both transfer orbit operation and on-station operation of a spacecraft, as recited in claim 27.

Instead, Hosick et al. discloses use of a "sensor suite 32" as follows:

The sensor suite 32 may include, for example, an earth sensor on an earth face 33 for two axis sensing (pitch and roll) relative to the earth and a set of gyroscopes 34 for inertial three-axis rate and attitude sensing. The spacecraft 20 may also be equipped with several sun sensors (not shown) and/or, more expensively, a star tracker (also not shown).

Hosick et al. at column 6, lines 59-65.

It is important to note that Hosick et al. does not state that the sensor suite 32 may include a star tracker, but instead states that the "spacecraft 20 may also be equipped with several sun sensors (not shown) and/or, more expensively, a star tracker (also not

shown)." *Id.* Such teachings in Hosick et al. would indicate the contemplation of conventional use of sensors (e.g., use of certain sensors for transfer orbit operations, and other sensors for on-station operations), rather than the use of a set of sensors for both transfer orbit operations and on-station operations, as recited in Claim 1.

In addition, Hosick et al. only discusses use of the "sensor suite 32" in connection with "orbit raising." See, e.g., Hosick et al. at column 9, line 57 through column 10, line 6, and FIG. 17. Hosick et al. does not even mention the use of the "sensor suite 32" in connection with on-station operations.

Thus, Hosick et al. does not disclose or suggest the use of an attitude sensor set that is adapted for use during both transfer orbit operation and on-station operation of a spacecraft.

The final office action states that "the star sensors [of Hosick et al.] are inherently capable of being the sole source [of] attitude sensor data [sic., data]." Final office action at page 5 (emphasis in original). However, inherency may not be established by probabilities or possibilities:

To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient."

In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted). See, MPEP 2112.

If the star sensors of Hosick et al. had such an "inherent" capability, there would be no need for additional sensors disclosed in Hosick et al. such as, for example, the earth sensor. Accordingly, inherency of this feature in Hosick et al. has not been established.

In view of the foregoing, applicants respectfully submit that the claim rejections based on alleged anticipation by Hosick et al. are improper and should be withdrawn, for the reasons set forth above.

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35 U.S.C. § 103(a) Rejections

Claim 17 has been rejected as obvious over Hosick et al. in view of the Boeing 702 fleet. Claims 23 and 24 have been rejected as obvious over Hosick et al. in view of Baghdasarian, U.S. Patent No. 6,010,096. Applicants respectfully traverse these rejections.

"To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." MPEP § 2143.03. As noted above with regard to the anticipation rejections, Hosick et al. does not disclose or suggest the use of an attitude sensor set that is adapted for use during both transfer orbit and on-station operations. The Boeing 702 fleet does not provide teachings to make up for the deficiencies of Hosick et al. in this regard. So, even if one were to combine the teachings of Hosick et al. with the teachings of the Boeing 702 fleet, one would not be able to achieve the invention of claim 17.

Similarly, even if one were to combine the teachings of Hosick et al. with the teachings of Baghdasarian, one would not be able to achieve the invention of claim 23 or claim 24 because the cited references do not teach or suggest the use of an attitude sensor set that is adapted for use during both transfer orbit and on-station operations.


Thus, *prima facie* obviousness cannot be established. Accordingly, the obviousness rejections of claim 17, 23, and 24 are improper and should be withdrawn.

Conclusion

For the foregoing reasons, reconsideration and withdrawal of the rejections of the claims and allowance thereof is respectfully requested. Should the examiner wish to discuss the foregoing, or any matter of form, in an effort to advance this application towards allowance, the examiner is urged to telephone the undersigned at the indicated number.

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Respectfully submitted,

By 
Gregory C. Mayer
Registration No.: 38,238

MARSHALL, GERSTEIN & BORUN LLP
233 S. Wacker Drive, Suite 6300
Sears Tower
Chicago, Illinois 60606-6357
(312) 474-6300
Attorneys for Applicant